

Kinematic Equations

Name _____

Date _____

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- a. An airplane accelerates down a runway at 3.20 m/s^2 for 32.8 s until it finally lifts off the ground. Determine the distance traveled before takeoff.
- b. A car starts from rest and accelerates uniformly over a time of 5.21 seconds for a distance of 110 m . Determine the acceleration of the car.
- c. Upton Chuck is riding the Giant Drop at Great America. If Upton free falls for 2.6 seconds , what will be his final velocity and how far will he fall?
- d. A race car accelerates uniformly from 18.5 m/s to 46.1 m/s in 2.47 seconds . Determine the acceleration of the car and the distance traveled.
- e. Rocket-powered sleds are used to test the human response to acceleration. If a rocket-powered sled is accelerated to a speed of 444 m/s in 1.8 seconds , then what is the acceleration and what is the distance that the sled travels?
- f. A bike accelerates uniformly from rest to a speed of 7.10 m/s over a distance of 35.4 m . Determine the acceleration of the bike.
- g. An engineer is designing the runway for an airport. Of the planes that will use the airport, the lowest acceleration rate is likely to be 3 m/s^2 . The takeoff speed for this plane will be 65 m/s . Assuming this minimum acceleration, what is the minimum allowed length for the runway?